CHAPTER

5

The Uncertainty of Budget Projections

The baseline projections in Chapters 1 and 2 represent the most likely of the possible outcomes for the budget and the economy, on the basis of current trends and the assumption that tax and spending policies now in place do not change. But considerable uncertainty surrounds those projections for two reasons. First, future legislation is likely to alter the paths of federal revenues and spending. The Congressional Budget Office does not predict future legislation—indeed, any attempt to incorporate future legislative changes in its baseline would undermine the usefulness of those numbers as a base against which to measure the effects of legislation. Second, the U.S. economy and the federal budget are highly complex and are affected by many economic and other changes that are difficult to predict. As a result, actual budgetary outcomes will almost certainly differ from CBO's baseline projections, even after adjustments for new legislation.

This chapter explores how the accuracy of the economic and technical assumptions that CBO incorporates in its baseline can affect the accuracy of its budget projections. Looking back, the chapter describes CBO's record of projections and shows how reliable CBO's current and future projections might be if they are as accurate as those of the past. Looking forward, it uses several scenarios to describe how the budget might differ from CBO's baseline projections.

The outlook for the budget (given current law and policies) can best be described not as the single row of numbers presented in CBO's tables but as a large spread, or fan, of possible outcomes around those numbers that widens as the projections extend. The fan in *Figure 5-1* is based on CBO's record of accuracy in its five-year budget projections. The baseline budget projections presented in Chapter 1 fall in the middle of the highest probabilities—shown in the darkest part of the figure. But nearby projections—other paths in the darkest part of the figure—have nearly the same probability of occurring as do the baseline projections. Moreover, projections that are quite different from the baseline also have a significant probability of coming to pass. On the basis of the historical record, the budget surplus or deficit would, in the absence of new legislation, fall within the fan around CBO's projections about 90 percent of the time.

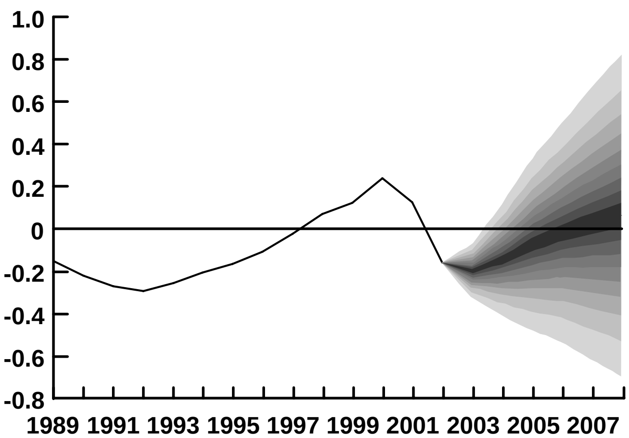
Figure 5-1 cannot be precisely accurate because the probabilities are themselves estimates; as such, they may misstate the true uncertainty of current projections. The record on which the fan chart is based is short, and it may not represent future uncertainty. Historically, CBO's projections have been least accurate around cyclical turning points (times when the economy moves from expansion to recession, or vice versa), which economists are generally unable to predict reliably. However, from 1981 (the earliest year for which complete data suitable for this analysis are available) until 2002, the economy experienced just three recessions (in 1981 and 1982, 1990 and 1991, and 2001) and two long expansions. Thus, CBO has limited information on the accuracy of its projections around turning points.

In addition to the uncertainty about cyclical turning points, the economic and budget trends that underlie the 10-year outlook are not clear. For example, measuring and forecasting the potential growth of the economy—an important part of the 10-year projections—are very difficult and involve assumptions about many factors that affect the growth of capital, labor supply, and total factor

Figure 5-1.

Uncertainty of CBO's Projections of the Total Budget Surplus Under Current Policies

(In trillions of dollars)



Source: Congressional Budget Office.

Note: Calculated on the basis of CBO's track record, this figure shows the estimated likelihood of alternative projections of the surplus under current policies. CBO's projections described in Chapter 1 fall in the middle of the darkest area. Under the assumption that tax and spending policies do not change, the probability is 10 percent that actual surpluses or deficits will fall in the darkest area and 90 percent that they will fall within the whole shaded area.

Actual surpluses or deficits will of course be affected by legislation enacted during the next 10 years, including decisions about discretionary spending. The effects of future legislation are not included in this figure.

For an explanation of how CBO calculates the probability distribution, see *Uncertainties in Projecting Budget Surpluses: A Discussion of Data and Methods* (February 2002), available at www.cbo.gov; an update of that publication will appear shortly.

productivity (which reflects the output from both capital and labor combined). Much uncertainty surrounds factors such as the enduring effect of the investment boom of the late 1990s, the pace of future technological improvements in IT (information technology) equipment, the impact of changes in the educational status of the labor force, developments in the world economy, and work and retirement patterns—including the full implications of the impending retirement of the baby-boom generation. Even small inaccuracies in the projected growth rate of potential output can have significant budgetary implications over the course of 10 years.

Another way to show the uncertainty of projections is to calculate the effects of specific sets of alternative assumptions on the outlook for the economy and the budget. To illustrate the possible implications of alternative cyclical and trend assumptions, CBO has chosen several scenarios. Two cyclical scenarios explore the possibilities of either a faster recovery than the one now shown in the baseline projections or, alternatively, another downturn—the second part of a double-dip recession. Other short-term scenarios focus on various possibilities of a war with Iraq. Two additional scenarios concentrate on differing assumptions about longer-term trends in productivity growth, effective tax rates on income, and medical costs. The first assumes that growth of labor productivity is higher than in the baseline, resembling that of the late 1990s, and that other budgetary trends (aside from legislation) also follow favorable paths, as they did in the same period. The second assumes slower growth in labor productivity, more like that of the 1973-1995 period, and less favorable budgetary trends. The projections that result from those various scenarios suggest a very wide range of possible outcomes for the budget.

Like the fan chart, the various scenarios illustrate how the range of uncertainty of budget projections expands as they are extended. The range is very large for the 10-year projections: for instance, choosing relatively optimistic or pessimistic, but still reasonable, assumptions about economic and budgetary trends could increase or decrease the projected cumulative 10-year budget surplus by several trillions of dollars. About three-quarters of the uncertainty in 10-year budget projections occurs in the last five years of the projection period. Looking forward a decade allows the Congress to consider the longer-term budgetary implications of specific policy changes, but it also increases the likelihood that budgetary decisions will be made on the basis of projections that later turn out to have been far wrong.

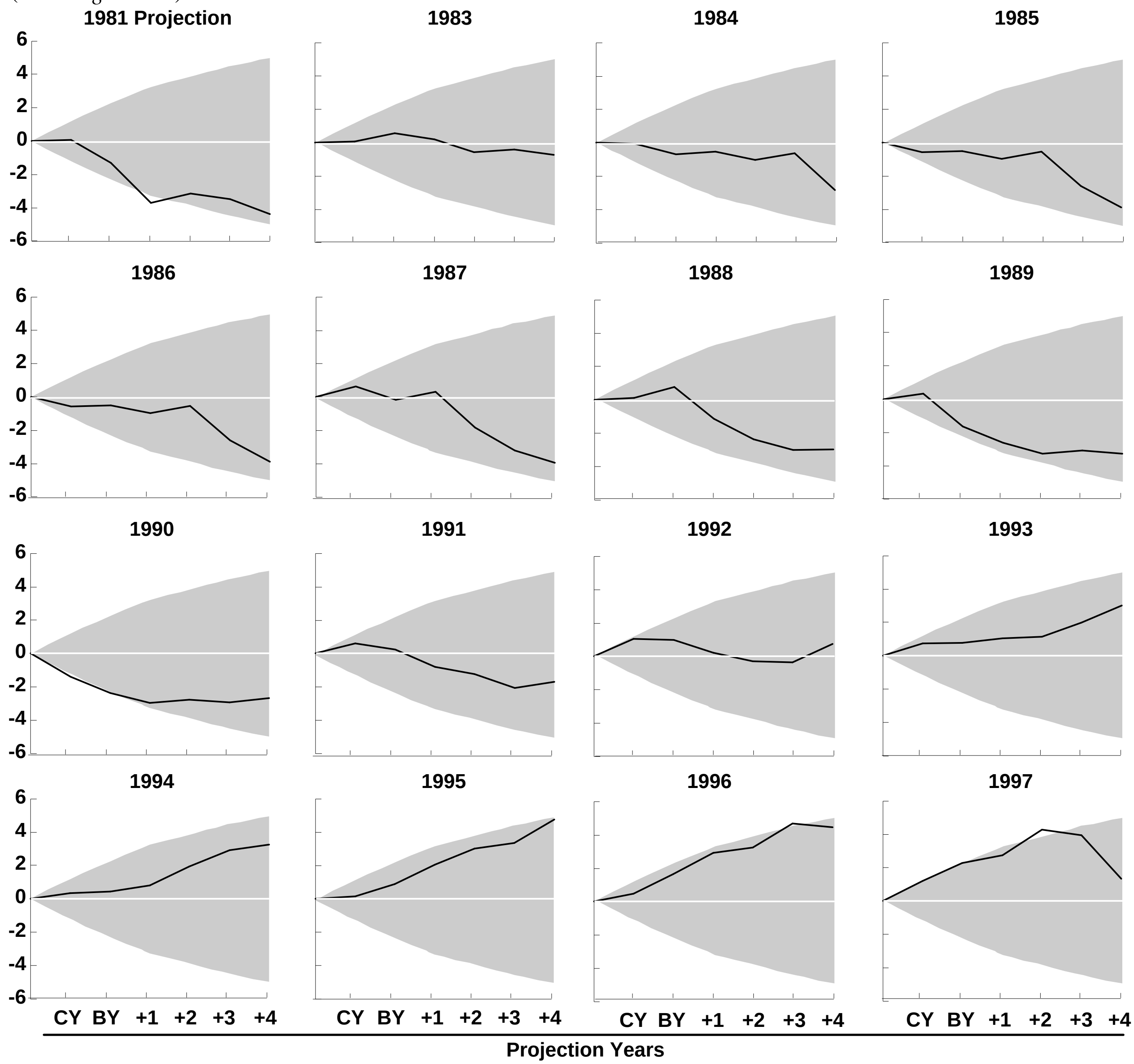
The Accuracy of CBO's Past Budget Projections

Baseline budget projections are bound to deviate from actual outcomes, but assessing the accuracy of previous projections is not a simple matter. Baseline projections are meant to serve as a neutral reference point for evaluating policy changes, so they make no assumptions about

Figure 5-2.

Misestimates in CBO's Projections Made from 1981 to 1997

(Percentage of GDP)



Source: Congressional Budget Office.

Notes: CY = current year; BY = budget year.

This figure shows misestimates in CBO's projections of the primary surplus—the total surplus excluding net interest—made at different times. Plotted points that lie below the center line reflect instances in which CBO overestimated the primary surplus, while points above the center line reflect underestimates. In each panel, the shaded cone indicates the estimated 90 percent confidence band; that is, there was a 90 percent chance that CBO's projection would be within the shaded area. CBO estimated that confidence band on the basis of its track record since 1981 (excluding 1982, because of insufficient data).

The figure excludes the effects of legislation enacted after the projections were made.

Box 5-1.

How CBO Analyzed Its Past Misestimates

This chapter distinguishes inaccuracies in budget projections that are correlated with the business cycle from inaccuracies in assessing trends that are unrelated to the business cycle.[1] That distinction is useful because inaccuracies in the assessment of trends are likely to grow indefinitely as the projection horizon extends, but inaccuracies correlated with the business cycle do not. In fact, according to the Congressional Budget Office's (CBO's) estimates, cyclical inaccuracies are small in the first two years of a projection period (that is, the current year and the budget year); for those two years CBO attempts to reflect its view of that cycle in its projection. Those inaccuracies plateau at a constant level for the next three years of the projection period, for which time CBO does not attempt to forecast the business cycle. The remaining inaccuracies grow almost linearly with the projection horizon. According to that decomposition, discrepancies between CBO's budget projections five years out and actual outcomes have consisted in roughly equal parts of discrepancies due to business cycles (which CBO does not attempt to project so far in advance) and inaccuracies in assessing the economic and other trends that underlie the budget.

1. A detailed discussion appears in *Uncertainties in Projecting Budget Surpluses: A Discussion of Data and Methods* (February 2002), available at www.cbo.gov. An updated version of that document will be available shortly.

For the purpose of this chapter, discretionary spending is handled somewhat differently than in CBO's usual analyses of revisions to budget projections. In its analyses of revisions, CBO allots any discrepancies between assumptions and outcomes to three categories: the effects of legislation, economic factors, and technical (estimating) factors. (For more details about those categories, see Chapter 1.) Discretionary spending is appropriated annually through new legislation, and as a result, legislation accounts for the lion's share of the differences between baseline projections and actual outlays for such programs. But for discretionary spending, the split is not available consistently throughout all of the historical record that CBO analyzes in this chapter. For that reason, CBO has excluded the small misestimates in discretionary spending for other (nonlegislative) reasons from its discussion of uncertainty here. Because economic and technical assumptions play only a small role in projections of discretionary spending, that omission makes very little difference to the results.

The discussion in this chapter also omits any distinction between economic and technical differences. That distinction is somewhat arbitrary, subject to change as the underlying economic data are revised, and unnecessary for this analysis.

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future legislation that might alter current budget policies. Of course, new legislation is likely to affect revenues and spending, but the purpose of baseline estimates is not to forecast legislation. Consequently, this chapter focuses on inaccuracies in projecting that stem from economic and technical factors and excludes the estimated effects of new legislation.

To assess the accuracy of its past annual projections, CBO compared those projections with actual budgetary outcomes and attempted to determine the sources of differences, after adjusting for the estimated effects of policy changes (*see Box 5-1*). The comparisons included 21 sets of projections for the ongoing fiscal year (the one in which the projections were made), 20 sets for the following fiscal year (referred to as the budget year), and 16 sets of projections that extend four more years into the future.[1] CBO used only the first five years of projections

1. The projections are those made in July 1981 and CBO's winter projections (usually published in January) from 1983 through 2002. Insufficient data were available to use projections made before 1981 or the projection made in early 1982. For projections made in 1997 and before, a full five years of estimates could be used. For projections made since that date, progressively shorter spans of estimates could be used because the most recent actual data against which they could be compared was for fiscal year 2002. To calculate the role of policy changes, CBO used estimates of the budgetary effects of legislative changes that were made close to the time that the legislation was enacted. (CBO has also examined in detail its record of economic forecasts. See Congressional Budget Office, *CBO's Economic Forecasting Record*, available at www.cbo.gov.)

Table 5-1.

Average Difference Between CBO's Budget Projections and Actual Outcomes Since 1981, Adjusted for Subsequent Legislation

(In percent)

	Year for Which the Projection Was Made					
	Current Year	Budget Year	Budget Year + 1	Budget Year + 2	Budget Year + 3	Budget Year + 4
	Difference as a Percentage of GDP					
Surplus or Deficit						
Average difference[a]	0.2	0.1	0	-0.1	-0.3	-0.5
Average absolute difference	0.5	1.2	1.6	2.1	2.6	3.2
Revenues						
Average difference	0	-0.1	-0.1	-0.2	-0.3	-0.5
Average absolute difference	0.4	0.9	1.3	1.6	1.8	2.1
Outlays						
Average difference	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1
Average absolute difference	0.3	0.5	0.6	0.8	1.0	1.2
	Difference as a Percentage of Actual Outcome					
Revenues						
Average difference	0	-0.5	-1.2	-1.6	-2.2	-3.5
Average absolute difference	1.9	4.6	6.8	8.3	9.6	11.5
Outlays						
Average difference	-0.9	-0.8	-0.9	-0.9	-0.6	-0.7
Average absolute difference	1.4	2.1	3.0	3.7	4.9	6.0

Source: Congressional Budget Office.

Notes: This comparison covers the projections that CBO published in July 1981 in *Baseline Budget Projections: Fiscal Years 1982-1986* and the ones it published each winter between 1983 and 2002 in *The Economic and Budget Outlook*.

The current year is the fiscal year in which the projections are made; the budget year is the following fiscal year.

Differences are actual values minus projected values. Unlike the average difference, the average absolute difference indicates the distance between the actual and projected values without regard to whether the projections are overestimates or underestimates.

a. A positive average difference for the surplus or deficit means that, on average, CBO underestimated the surplus or overestimated the deficit; and a negative average difference, the opposite.

because its record is not long enough to draw conclusions from 10-year projections. On average, the absolute difference (without regard to whether the difference was positive or negative) between CBO's estimate of the federal surplus or deficit and the actual result was 0.5 percent of gross domestic product for the ongoing fiscal year and 1.2 percent for the budget year; by the fourth year beyond the budget year, CBO's estimate (adjusted for the effects of subsequent legislation) rose to 3.2 percent (*see Table 5-1*). If those averages were applied to CBO's current baseline, the actual surplus or deficit could be expected to differ in one direction or the other from the corresponding projection by roughly $55 billion in 2003, $135 billion in 2004, and $450 billion in 2008, aside from the effects of legislative changes.

Misestimates of revenues have generally been larger than misestimates of outlays, reflecting the greater sensitivity of revenues to economic developments. In absolute terms, revenue projections have differed from actual outcomes by an average of about 1.9 percent for the current year, 4.6 percent for the budget year, and 11.5 percent for the fourth year beyond the budget year. Inaccuracies in outlay projections were about a third smaller than those in revenue projections for the current year and about half as large for the budget year and subsequent years.

The misestimates of the budget's bottom line went in both directions: sometimes the projections were too high and at other times too low. On average, CBO's projection of the surplus or deficit has tended to be slightly pessimistic—that is, CBO overestimated deficits—for the current and budget years and slightly optimistic for the third and fourth years beyond the budget year. However, the averages of the underestimates and overestimates for the six years have not been statistically significant, so in the calculations underlying Figure 5-1, the average inaccuracy was assumed to be zero.

Similar conclusions can be drawn from looking at the history of CBO's estimates of the primary surplus—the total budget surplus excluding net interest—for each of the 16 full (six-year) baseline projections in the sample period.[2] In each case in *Figure 5-2,* the shaded cone corresponds to an area similar to that shown by the fan in Figure 5-1, which is likely to capture a misestimate about 90 percent of the time. Both figures reflect a statistical analysis of CBO's past misestimates of revenues and outlays.[3] Misestimates above the center of the cones represent instances in which CBO underestimated the primary surplus, while misestimates that lie below the center of the cones are times when CBO overestimated the primary surplus—in all cases, apart from the effects of subsequent legislation.

As the graphs in Figure 5-2 show, CBO's baseline projections have sometimes been very close to the mark, especially in the short run. While the five-year budget projections made between 1993 and 1997 tended to be too pessimistic, those made earlier tended to be too optimistic.

Finally, projections made around the times of large changes in taxes generally would not have been improved if those projections had incorporated larger "feedback effects" on the budget from anticipated responses of capital and labor supply. For example, adding revenues to the 1983 baseline projection of the primary surplus to reflect larger supply-side effects of the Economic Recovery Tax Act of 1981 and the Tax Equity and Fiscal Responsibility Act of 1982 than the amount assumed in that baseline would have increased rather than reduced the inaccuracies in that projection.[4] Similarly, assuming larger supply-side effects of the Omnibus Budget Reconciliation Act of 1993 than those incorporated in the 1994 baseline would have reduced the projected level of revenues and magnified the inaccuracies in projecting the budget balance. Inaccuracies in some years of the 1991 baseline, which followed the Omnibus Budget Reconciliation Act of 1990, would have been increased by assuming larger negative feedbacks from the tax increase.

Sources of Past Inaccuracies in Projecting Revenues

Misestimates of revenues are rarely attributable to a single cause, but a few major factors can be identified. Both unexpected recessions and unexpectedly rapid expansions can be a problem for revenue projections—as noted earlier, predicting turning points in the business cycle is one of the most difficult challenges facing economic forecasters. Thus, revenues tend to be overestimated in projections done just before recessions and underestimated in projections made before rapid expansions. Until the recent recession, the major source of inaccuracies in revenue projections made during the economic expansion of 1995 through 2000 was the failure to predict the apparent acceleration in the trend growth of the economy and the economic changes associated with it. In particular, the boom in the stock market led to huge capital gains on paper, which boosted tax revenues as investors began to realize those gains. At the same time, the income of

2. Baselines after January 1997 are not shown, because fewer than six years of actual outcomes are available for measuring inaccuracies. The graphs in Figure 5-2 feature primary surpluses–that is, surpluses excluding net interest. Including net interest would muddy the comparisons because the relationship between budget balance and interest costs depends on interest rates, which vary.

3. See Congressional Budget Office, *Uncertainties in Projecting Budget Surpluses: A Discussion of Data and Methods* (February 2002), available at www.cbo.gov. An updated version will be available shortly.

4. The Joint Committee on Taxation's estimates for the effects of the Economic Recovery Tax Act of 1981 on revenues stop at 1986.

households in the highest tax brackets grew faster than income on average, raising effective tax rates.

The unexpected shortfall in receipts in 2001 and 2002 was very likely due to some unwinding of the same factors that pushed receipts above expectations in the 1995-2000 period. Capital gains realizations fell substantially in 2001; other causes (as yet unidentified) reduced effective tax rates on income besides capital gains. The causes of the shortfall will not be fully known until all of the data from tax returns for 2001 and 2002 are tabulated over the next year and a half.

Sources of Past Inaccuracies in Projecting Mandatory Outlays

Economic performance affects federal spending, both directly and indirectly. CBO often overestimated inflation in its projections in the early 1980s, and more recently it anticipated an upturn in inflation during the late 1990s that did not occur. Estimates of inflation that are too high result in overestimates not only of cost-of-living adjustments for beneficiaries of many benefit programs but also of reimbursements for health care providers. CBO also overestimated unemployment rates in the 1990s, leading to corresponding overstatements of caseloads for means-tested benefit programs (such as the Food Stamp program and Medicaid).

Misestimates of those broad economic trends, however, accounted for only part of the inaccuracies in past projections of mandatory outlays. The remainder came from inaccurate assumptions about such factors as what proportion of eligible individuals and families would participate in benefit programs, how sound financial institutions would be, and how health care providers would behave—factors that can be extremely difficult to predict. For example, the deposit insurance crisis of the 1980s was not fully anticipated, and the year-by-year costs for its cleanup were highly variable and hard to estimate. CBO also did not fully anticipate either the expansion between the late 1980s and the late 1990s of states' use of creative financing mechanisms to obtain federal Medicaid funds or the temporary slowing of the growth of Medicare costs in the late 1990s.

Alternative Economic and Budget Scenarios

Another way of looking at the uncertainty of today's projections is to consider how different scenarios could affect the budgetary outcome. Those alternative scenarios can provide a qualitative understanding of how budget projections can miss the mark, although assigning probabilities to the various outcomes is generally not possible.

Short-Term Economic Uncertainty

CBO's baseline economic forecast for 2003 and 2004 (described in Chapter 2) lies in the middle of a range of possible outcomes. Both substantially weaker and substantially stronger outcomes are possible. The economy has moved from the recovery period after the recession into an expansion phase, which means no more than that the level of real gross domestic product has exceeded the peak that it reached in the fourth quarter of 2000.[5] The expansion could still be quite fragile, however, given the continued economic weakness in the rest of the world, the likelihood that consumer spending will grow no faster than income, and the uncertainty of businesses' willingness to invest (highlighted in the baseline forecast). But some signs point in a more optimistic direction. In particular, the extraordinary growth of productivity throughout the recent recession suggests that businesses have done a great deal of cost-cutting and may therefore be poised to embark on new investment. The dollar has also begun to fall, so the United States may capture a larger proportion of world trade, weak though it is.

In addition, much uncertainty exists in the short term about the amount of tax receipts. In recent years, tax receipts have swung by more than would be expected if the economic cycle was the only thing at work—first rising even more than income in the economic boom of the late 1990s, and then falling more than income during the past

5. The Business Cycle Dating Committee of the National Bureau of Economic Research (the private group whose assignment of dates for recessions is universally accepted) has not yet announced a date for the trough of the recession.

Box 5-2.

The Costs and Risks of Deflation

Last year's low rate of inflation, the current pause in the growth of demand, and lower prices for many types of consumer goods increase the likelihood that the overall level of prices may actually begin to fall sometime in the next two years. The United States has not experienced a persistent, generalized decline in prices—deflation—since the Depression of the 1930s, but a few analysts are concerned that the country may soon face a protracted period of slow growth of output and declining prices throughout the economy.

Deflation, if largely unanticipated, can lead to stagnation by making it difficult for debtors, both households and businesses, to keep up with payments on their debt. Debt taken on at interest rates that appeared reasonable under the assumption of even slowly rising prices of assets and some growth in wages and profits could become unmanageable if either asset prices or incomes decline steadily.

Such deflation could compromise the Federal Reserve's ability to stimulate the economy. Although the Federal Reserve could lower the federal funds rate (currently at 1¼ percent) to zero, the real (inflation-adjusted) interest rate would still be high if the general price level was falling by 3 percent or 4 percent a year. Such a high real interest rate would not encourage investment or other spending when the economy was weak.

However, such deflation-induced economic stagnation for the United States seems unlikely. The low rates of inflation of the past five years stem primarily from rapid growth of productivity and, to a lesser extent, from low import prices. If that pattern continues, asset prices and wages and profits can continue to grow even if the overall level of prices is falling slightly. In essence, nominal gross domestic product could grow even with mild deflation. Such growth would mitigate defaults and keep deflation from seriously affecting the growth of demand.

Moreover, policies other than reductions in short-term interest rates would still be available. The Federal Reserve could still expand the monetary base and reduce long-term interest rates (which are farther from zero) by purchasing Treasury securities at longer maturities. Fiscal policies such as large and immediate tax cuts or spending increases would also help to stimulate the economy in the short run, especially if used in conjunction with monetary policies.

Furthermore, the flexibility of the U.S. economy reduces the likelihood of a protracted period of stagnation. Labor and capital markets are more flexible than they were in the 1930s, systems of financial intermediation are much stronger, and trade is more open. Moreover, the U.S. economy is much more flexible than most foreign economies. Therefore, Japan's experience over the past 12 years —a period of moderate deflation and subpar growth that started after a precipitous decline in Japanese equity and property prices—does not presage future problems here. The situation in Japan has been aggravated by the massive number of nonperforming loans (for which debtors are not keeping up with their payments) in its banks' portfolios.

Conversely, the high levels of household debt in the United States and the high percentage of household income that is used to service debt increase the likelihood of a recession if deflation does materialize. High debt levels expose a potentially large number of households to default if the growth of income slows dramatically. Unfortunately, good estimates of the number of households at risk are not available, but various indicators imply serious financial troubles for at least a small percentage of households, in spite of households' recent opportunities to improve their situations by refinancing their mortgages.

On balance, however, the risks of deflation-induced stagnation are small. Even if the general price level does start to fall, macroeconomic policies and the economy's natural ability to weather shocks are likely to keep deflation from becoming entrenched.

Table 5-2.

Alternative Scenarios for the Economy and the Budget in the Short Term

	Changes from CBO's Baseline	
	2003	2004
Double-Dip Recession		
Real GDP (Percent)	-1.9	-2.5
Important Tax Bases[a] (Percent)	-2.8	-2.6
Short-Term Interest Rates (Percentage points)	-0.5	-2.8
Effect on Budget Balance (Billions of dollars)		
Portion attributable to economic factors	-37	-46
Portion attributable to technical factors[b]	-18	-14
Total	**-55**	**-61**
Rapid Expansion		
Real GDP (Percent)	+1.7	+2.0
Important Tax Bases[a] (Percent)	+2.6	+3.1
Short-Term Interest Rates (Percentage points)	+0.3	+1.5
Effect on Budget Balance (Billions of dollars)		
Portion attributable to economic factors	+36	+54
Portion attributable to technical factors[b]	+18	+14
Total	**+54**	**+68**

Source: Congressional Budget Office

Note: Economic data are by calendar year; budget data, by fiscal year.

a. Wages and salaries plus corporate profits. Those two categories of income are particularly significant for revenue projections because they are taxed at the highest effective rates.

b. Assumes that tax receipts from a given projection of economic activity differ from what was anticipated.

two years. CBO has constructed two scenarios to illustrate the range of possibilities in the short run, both for the economic outlook and for tax receipts.

Double-Dip Recession. The economy could turn rapidly worse in 2003 if the imbalances that precipitated the last recession have not been fully worked out. The areas to watch include the response of consumers to their loss of wealth in the stock market's decline, and the willingness of businesses to invest in the face of excess capacity and the prospect of no more than modest growth in consumer demand. The economy could tip into recession if consumers slow the growth of their spending to much below the growth of their income. Some forecasters are also concerned that with a weak economy might come more widespread deflation, which currently exists in the goods market, although CBO's scenario does not assume falling prices economywide (*see Box 5-2*).

The recession scenario that CBO has constructed assumes weaker growth across the board in spending by consumers, businesses, state and local governments, and foreigners (*see Table 5-2*). In the scenario, the Federal Reserve does not fully anticipate the slowing demand, and the downturn proceeds too rapidly for monetary policy to stop it or for the Administration and the Congress to respond with timely legislation. With three quarters of negative growth in 2003, the growth of real GDP is 1.9 percentage points below the baseline this year and remains lower in 2004. Corporate profits and dividends fall more than proportionately in response to GDP, contributing to a more-than-proportionate decline in the major tax bases (wages and salaries, plus corporate profits). Unemployment rates are over 1 percentage point higher in 2004. The scenario also assumes that tax receipts are even lower than the weaker economic activity suggests. Consequently, the budget deficit would worsen by $55 billion this fiscal year and $61 billion in 2004.

Table 5-3.

Potential Economic and Budgetary Effects of War in Iraq

	Changes from Baseline	
	2003	2004
Benign Scenario		
Oil Prices (Dollars per barrel)	2.8	0
Real GDP (Percent)	0.2	0.4
Inflation (Percentage points)	0.1	0.1
Short-Term Interest Rates (Percentage points)	0.1	0.7
Effect on Budget Balance (Billions of dollars)	-20.4	-14.5
Intermediate Scenario		
Oil Prices (Dollars per barrel)	13.5	10.0
Real GDP (Percent)	-1.8	-2.0
Inflation (Percentage points)	0.7	0.5
Short-Term Interest Rates (Percentage points)	-0.9	-0.9
Effect on Budget Balance (Billions of dollars)	-35.9	-67.1
Worst Scenario		
Oil Prices (Dollars per barrel)	36.5	20.0
Real GDP (Percent)	-4.4	-4.4
Inflation (Percentage points)	1.8	0.4
Short-Term Interest Rates (Percentage points)	-1.4	-2.7
Effect on Budget Balance (Billions of dollars)	-63.7	-119.3

Source: Macroeconomic Advisers, LLC, *After an Attack on Iraq: The Economic Consequences*, December 24, 2002.

Notes: The scenarios are by Macroeconomic Advisers (MA), which based its budget calculations on CBO's estimates of the monthly costs of war with Iraq (see Box 1-3 on page 10). What MA calls the benign scenario is based on a decisive victory after four to six weeks of fighting; the intermediate scenario incorporates six to 12 weeks of fighting and some damage to Iraq's oil facilities; and the worst scenario incorporates three to six months of fighting, major casualties, and severe damage to Iraq's infrastructure.

Economic data are by calendar year; budget data, by fiscal year.

Rapid Expansion. A more optimistic interpretation of recent events is also possible. Stock market prices suggest that investors are discounting the current weakness in corporate earnings and looking forward to substantial improvements. The recent strength of consumer spending may demonstrate that the loss of wealth since 1999 does not affect consumers' spending plans very much. If people still feel wealthy—the wealth-to-income ratio has not fallen below the trend it followed before 1995—consumption may continue with vigor. The Federal Reserve has, in the process of lowering interest rates, sharply expanded the money supply, providing the wherewithal for a burst in demand. Moreover, businesses may have finished cutting costs and revising their plans and now may be ready to invest more strongly than expected.

The scenario that CBO has constructed assumes that the growth of consumption is significantly stronger in 2003 and that this additional spending stimulates business investment. The growth of exports also picks up, possibly because of faster growth abroad. The stronger growth means that state and local governments have more revenues than they expected and therefore are able to balance their budgets with smaller cuts in purchases and other spending. Consequently, the growth of real GDP is more than a percentage point higher in 2003 than it is in the baseline, and remains higher in 2004. The scenario also assumes that tax receipts are even higher than the increase in economic activity suggests. As a result of those assumptions, the budget deficit would narrow by $54 billion in 2003 and by $68 billion in 2004, compared with CBO's baseline.

War with Iraq

CBO's baseline assumes no significant repercussions for the U.S. economy from any possible military activity in Iraq. Certainly, though, a war could affect the outlook both for the economy and for the budget.

A war's effect on the economy, including its impact on oil prices and on the confidence of consumers and businesses, obviously depends on its outcome. In order to assess the possible effects of war on the U.S. economy, CBO has turned to a recent analysis by Macroeconomic Advisers (MA).[6] That analysis considers three scenarios. In the most benign scenario, victory is quick and decisive, with hostilities ending in four to six weeks and without serious political repercussions for other states in the region. With little damage to wells and ports, oil production quickly resumes and—because the war is over—oil prices no longer include a risk premium and may even fall. In an intermediate scenario, fighting extends six to 12 weeks, and tensions persist even after the main fighting is over. With some damage to oil facilities, production is down. In the worst scenario, fighting lasts between three and six months, produces major casualties, and severely damages Iraq's infrastructure. In this scenario, the United States faces major geopolitical problems, including widespread resentment in Arab countries, that undermine the confidence of U.S. consumers and businesses even after fighting has ended.

In MA's analysis, the most benign scenario, with a quick finish to the war, could provide a short-term lift to the economy that comes from lower oil prices and the removal of uncertainty about the nature of the war (*see Table 5-3*). In the other two scenarios, the economic effects are serious enough to produce either a pause in growth or a double-dip recession. (Conflict with Iraq is unlikely to provide much immediate direct economic stimulus from government spending, because it is likely to be fought using equipment and munitions that have already been purchased.) By MA's calculations, the war would increase the federal budget deficit by amounts ranging from $20 billion to $64 billion in 2003 and from $14 billion to $120 billion in 2004. (CBO has no estimates of the overall budgetary costs of a war, although Box 1-3 on page 10 provides estimates of monthly costs and the costs of some activities. MA used those estimates in its budget calculations.)

Those scenarios are obviously only examples. MA's calculations include attempts to put numbers on several imponderables: how the war might turn out and how consumers and businesses might react to the potential increase in risk. Moreover, while MA provided probability estimates for the various scenarios, CBO prefers not to assess odds; the scenarios stand simply as examples of the kinds of things that might happen.

Trends in Productivity, Effective Tax Rates, and Medical Costs

In CBO's 10-year outlooks, important sources of past misestimates have been in projecting the growth of productivity; revenues relative to income, or effective tax rates; and turning points for programs with a history of volatile growth rates, such as Medicare and Medicaid. In all three areas, trends in the second half of the 1990s were relatively favorable to the budget's bottom line. Those years saw not only strong growth of productivity but also a sharp increase in taxes relative to GDP and a relatively slow increase in the growth of federal spending for the Medicaid and Medicare programs. CBO's baseline projections anticipate less favorable trends in all three areas, even after the economy fully recovers from recession. This section considers two alternative scenarios: one in which trends are as favorable as they were in the second half of the 1990s and the other in which they deteriorate even more than in CBO's assumptions for its baseline. The two scenarios illustrate possible paths and are not intended to be completely symmetrical.

The scenarios illustrate a wide range of possible budgetary outcomes. Over the 10 years from 2004 through 2013, the optimistic scenario implies $3.2 trillion more in total surpluses than CBO's baseline does. The pessimistic scenario implies cumulative deficits that increase the government's debt by nearly $3.2 trillion over the amount in CBO's baseline. In each case, 75 percent of the difference occurs in the last five years, emphasizing

6. Macroeconomic Advisers, LLC, *After an Attack on Iraq: The Economic Consequences*, December 24, 2002. The analysis—which grew out of a symposium on November 12, 2002, organized by the Center for Strategic and International Studies in Washington, D.C.—summarizes the conclusions of the participants, who included experts on political and military affairs, oil and financial markets, and economic forecasting, and describes in detail the economic simulation analysis that was MA's contribution to the event.

Table 5-4.

Alternative 10-Year Scenarios for the Economy and the Budget

	Changes from CBO's Baseline: Assumptions (Percentage points)		Changes from CBO's Baseline: Budgetary Effects (Billions of dollars)		
	2003-2008	2009-2013	2004-2008	2009-2013	2004-2013
Optimistic Scenario					
Growth of Productivity	+0.4	+0.4	+231	+860	+1,091
Effective Tax Rate[a]	+0.6	+1.6	+381	+1,212	+1,593
Growth of Medicare and Medicaid	-2.0	-2.0	+97	+374	+470
Total			**+709**	**+2,446**	**+3,154**
Pessimistic Scenario					
Growth of Productivity	-0.4	-0.4	-230	-839	-1,069
Effective Tax Rate[a]	-0.6	-1.6	-381	-1,212	-1,593
Growth of Medicare and Medicaid	+2.0	+2.0	-101	-429	-530
Total			**-712**	**-2,480**	**-3,192**

Source: Congressional Budget Office.

Note: Economic data are by calendar year; budget data, by fiscal year.

a. Personal tax as a percentage of taxable personal income. The difference from CBO's baseline grows at 0.2 percentage points per year, reaching 2.0 percent in 2013.

that budget projections for the 2009-2013 period are even more uncertain than those for the earlier years.

Scenario Based on Optimistic Trends. In CBO's optimistic 10-year scenario, the favorable trends for the budget that existed between 1996 and 2000 continue more or less unabated after the economy recovers from the 2001 recession. Average growth of labor productivity from 2002 to 2013 matches that from 1996 through 2000 and so is 0.4 percentage points higher than that assumed in the baseline (*see Table 5-4*). As a result, real GDP grows at a rate that is 0.4 percentage points higher than in the baseline. In addition, the scenario assumes that the effective tax rate on taxable personal income grows faster than it does in the baseline projection and is about 2 percentage points above the baseline by 2013. (The effective rate rose by a couple of percentage points —excluding the more predictable effects of real bracket creep—over the 1995-2000 period and then fell by a similar amount in the past two years.) On the outlay side of the budget, the optimistic scenario assumes that spending for Medicare and Medicaid will grow at an annual rate that is 2 percentage points lower than the rate in the baseline.

The budget outlook would improve dramatically under the assumptions of the scenario based on optimistic trends. Over the decade, if there was no other action to cut taxes or increase spending, the cumulative surplus would reach $4.5 trillion (about three times the surplus projected in the baseline). With a surplus of that magnitude, the government's holdings of assets (uncommitted funds) would exceed federal debt held by the public by more than $400 billion at the end of 2013.[7]

Scenario Based on Pessimistic Trends. CBO's pessimistic 10-year scenario reverses most of the assumptions of the optimistic scenario and assumes that the economy reverts in many respects to its situation before 1996. In this scenario, trends in the economy are generally unfavorable to the budget. The scenario assumes that the recent burst

7. "Uncommitted funds" is CBO's term for the surplus that remains each year after paying down all publicly held debt that is available for redemption.

Box 5-3.

Potential Effect of an Unfavorable Trend in Workers' Level of Education

For many years, the average levels of education and skill of the U.S. workforce have been rising, contributing to the growth of productivity. However, according to some forecasters, that contribution may substantially diminish, or even end, within the next decade. The improvement in the educational level of successive cohorts of workers has already begun to level off. Moreover, as immigrants become a large factor in the growth of the labor force, their generally lower level of education tends to hold down the average.

Available estimates suggest that the upward trend in formal education in the past accounted for about 0.3 percentage points of growth of productivity per year: that component of productivity growth would be at risk if the educational quality of the labor force stopped improving.[1] The Congressional Budget Office (CBO) has not incorporated such a slowing of productivity growth in its 10-year projections, however, because other factors may offset the slowing rate of improvement in workers' education. As long as highly skilled employees are valuable to employers, skill levels are likely to increase. If formal education is not producing enough highly skilled employees, then on-the-job training and similar approaches should become more prevalent.

Past studies do not help much in projecting the contribution of those less formal methods of improving skills. Analysis of productivity trends has not generally focused on those methods, because relevant data are hard to obtain. Some of the effects of informal training may be picked up in empirical estimates of the effects of formal schooling, to the extent that the two were correlated in the past. However, the extent of correlation is unknown, and future trends may differ.

Consequently, the assumption that the skills businesses need will be generated one way or another is based on theory rather than observable fact. If it is wrong, growth of gross domestic product over the next 10 years might be as much as 0.2 percentage points lower, on average, than CBO projects. That would cut about $460 billion from the projected budget surplus over 10 years.

1. Dale W. Jorgenson, Mun S. Ho, and Kevin Stiroh, "Projecting Productivity Growth: Lessons from the U.S. Growth Resurgence," *Economic Review*, Federal Reserve Bank of Atlanta, vol. 87, no. 3 (2002).

of productivity proves temporary, so future growth of productivity averages only the 1.4 percent rate seen from 1974 through 1995 (cyclically adjusted), implying correspondingly lower growth of GDP. Productivity growth might slow for a number of reasons: for example, if businesses have learned how to step up to a higher level of productivity by improving their use of computers, the growth of productivity will slow when most businesses have achieved that efficiency. Any slowing in the rate of improvement of the skills of the workforce might also diminish the growth of productivity (*see Box 5-3*). In addition to those economic factors, the scenario assumes that the effective tax rate on taxable personal income rises more slowly than in the baseline projections and is about 2 percentage points lower by 2013. Similarly, the scenario assumes that Medicare and Medicaid spending grows 2 percentage points faster each year than it does in the baseline.

In this scenario based on pessimistic trends, the budget balance remains in overall deficit throughout the projection period. Debt held by the public would rise to more than $5.5 trillion by the end of 2013, compared with less than $2.6 trillion under assumptions for the baseline.